

PATENT ABSTRACTS OF JAPAN

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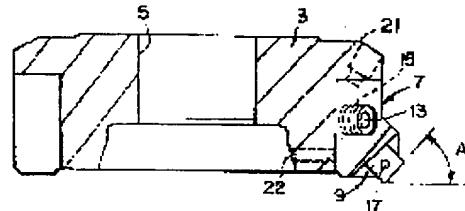
(22)Date of filing : 14.07.1993 (72)Inventor : NAKAMURA KINYA
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(54) FACE MILLING CUTTER

(57)Abstract:

PURPOSE: To provide a face milling cutter by which a cutting edge chip can be fixed reliably to a cutter body formed of aluminium alloy.

CONSTITUTION: In a face milling cutter, since constitution is set in such a way that an insert nut 15 is embedded in a cutter body 3 formed of aluminium alloy, and a cartridge 7 to which a cutting edge tip 9 is fixed is fixed by a bolt 13, even if the cutter body 3 is formed of aluminium alloy, the cutting edge tip 9 can be fixed reliably.



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CLAIMS

[Claim(s)]

[Claim 1] the body of a cutter which consists of an aluminium alloy, and a cutting edge -- the face cutter characterized by having the cartridge to which the chip was fixed, and the insertion nut embedded on said body of a cutter, and carrying out bolt immobilization of said cartridge through said insertion nut at the body of a cutter.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] Especially this invention relates to the face cutter whose body of a cutter is a product made from an aluminium alloy about a face cutter.

[0002]

[Description of the Prior Art] the conventional face cutter -- a cutting edge -- since the body of a cutter furnished with a chip was manufactured from steel, it had the problem that weight was heavy and handling became inconvenient. If it was in the large-sized face cutter especially, it was still more so.

[0003] The configuration which attained lightweight-ization of weight by making the body of a cutter into the product made from an aluminium alloy is indicated by JP,63-17606,Y to this trouble. furthermore -- since an aluminium alloy is comparatively soft and it will be made this official report by being deleted by the bolt with the technique of an indication, if the body of a cutter is made into the product made from an aluminium alloy -- a cutting edge -- the ** which does not use a bolt for immobilization of a chip -- a piece and a wedge -- using -- a cutting edge -- the configuration which fixes a chip is indicated.

[0004]

[Problem(s) to be Solved by the Invention] however -- the face cutter indicated by this official report -- a wedge -- a cutting edge -- since the wedge and aluminum containing alloy which were tempered although pressure-welding immobilization of the chip was carried out are rubbed directly -- a body -- wear -- deforming -- a cutting edge -- positive immobilization of a chip -- it cannot do -- a cutting edge -- the trouble of being easy to produce a location gap and slack is in a chip.

[0005] then, the purpose of this invention -- the body of a cutter made from an aluminium alloy -- a cutting edge -- it is offering the face cutter which can certainly fix a chip.

[0006]

[Means for Solving the Problem] the body of a cutter with which the face cutter of this invention consists of an aluminium alloy in order to attain said purpose, and a cutting edge -- it has the cartridge to which the chip was fixed, and the insertion nut embedded on said body of a cutter, and said cartridge is characterized by carrying out bolt immobilization at the body of a cutter through said insertion nut.

[0007]

[Function] the face cutter of this invention -- a cutting edge -- in fixing a chip, a cartridge is fixed, next it carries out bolt immobilization of the cartridge at the body of a cutter made from an aluminium alloy. since it is not what a bolt is screwed in the insertion nut embedded on the body of a cutter, and is screwed in the body of a cutter made from a direct aluminium alloy -- a cutting edge -- saying [that a bolt shaves the body of a cutter and loosens at the time of anchoring of a chip and cutting] -- there is nothing -- a cutting edge -- a chip is certainly fixable.

[0008]

[Example] Below, with reference to an accompanying drawing, the example of this invention is

explained at a detail.

[0009] As shown in drawing 1 and drawing 2, the face cutter 1 of this invention is the so-called thing which cuts a flat surface etc. and which carries out double-sided cutting. The body 3 of a cutter of this face cutter 1 is manufactured from the aluminium cast, and while lightweight-ization of the body of a cutter is attained, that manufacture can be performed easily. Through the installation hole 5, this body 3 of a cutter is attached in the driving shaft of a face cutter, and is driven.

[0010] the cartridge [body / of a cutter / 3] 7 of plurality [transverse plane / the], and this example -- five cutting edges -- the cartridge 7 is arranged at equal intervals. In addition, in drawing 2, the pocket 10 for discharging scraps is formed before each cartridge 7.

[0011] this cutting edge -- the cartridge 7 is being fixed to the body 3 of a cutter through the insertion nut 15 with the bolt 13.

[0012] a cutting edge -- a chip 9 -- the so-called product made from superhard -- it is -- bis-- it is being fixed to the cartridge 7 by 17. this cutting edge -- a chip 9 -- the time of cutting -- a cutting edge -- it is attached so that a part may form the predetermined corner angle A. such a cutting edge -- the cutting edge in which the corner angle A of a chip 9 formed the various corner angles A beforehand -- what what fixed the chip 9 to the cartridge 7 is made into one for -- these cutting edges -- it can change now easily by exchanging a cartridge 7.

[0013] Moreover, it has the inclination of the predetermined include angle C also to the production of the radius of the body 3 of a cutter, and this predetermined include angle C is set as about 3 times by this example.

[0014] a cutting edge -- for a chip 9, it discharges further, without forming the breaker 19, making the cut-down scraps curl, and making the body 3 of a cutter contact, as shown at drawing 3. Although this breaker 19 is a perimeter breaker with an include angle and forms rake angle B of the direction of a path of the body 3 of a cutter in about 10 thru/or 20 degrees, a breaker may not be with an include angle and may be circular. By forming a rake angle in such range, the load at the time of cutting is mitigable.

[0015] A cartridge 7 is steel and is being fixed to the body 3 of a cutter with the bolt 13. Since it is screwed in the insertion nut 15 beforehand embedded on the body 3 of a cutter as shown in drawing 4, a bolt 13 is certainly fixable, even if it is the comparatively soft body 3 of a cutter, since it is a product made from an aluminium alloy. As an insertion nut 15, en ZATO (trademark) made from KERUBUKONASU (Kerb Konus) is used, for example.

[0016] in addition, the *** 21 established on the cartridge 7 into drawing 1 -- a cutting edge -- the screw thread for accommodation of the cutting location of a chip -- it is -- the cutting edge after attaching a cartridge 7 in the body 3 of a cutter -- the location of a chip 9 can be fine-adjusted now.

[0017] Next, an operation of this example is explained.

[0018] the face cutter 1 by this example -- setting -- the body 3 of a cutter -- a cutting edge -- when attaching a chip 9, it fixes to the cartridge 7 beforehand fixed to the body with a bolt 17, thereby -- a cutting edge -- a chip 9 can be attached easily. In addition, the cartridge 7 is thrown away at the time of breakage. such a cutting edge -- since the body 3 of a cutter is made from the aluminium alloy at the time of installation of a chip 9 and cutting -- very -- lightweight -- a cutting edge -- anchoring and cutting of a chip 9 can be performed easily.

[0019] the minute amount adjusting screws 21 and 22 after fixing a cartridge 7 with a bolt 13 -- a cutting edge -- the direction of a path of a chip 9 and a shaft-orientations location are adjusted. thus -- this example -- a cutting edge -- it has come to be able to perform the minute amount accommodation after anchoring of a chip 9

[0020] Moreover, since the insertion nut 15 is used for immobilization of a cartridge 7 at the body 3 of a cutter, even if it is the body 3 of a cutter made from an aluminium alloy, a cartridge 7 is certainly fixable with the steel bolt 13.

[0021] At the time of cutting, the body 3 of a cutter consists of aluminium alloys, it is dealt with from a lightweight thing, and workability is good at a low price. Furthermore, since the attenuation factor is large as compared with steel etc., an aluminium alloy can prevent the vibration at the time of cutting, and, thereby, can aim at prevention of the noise, and

improvement in a tool life. for example, a cutting edge -- although it was impossible to use it by about 0.2mm in the case of the conventional steel if it was in the tool life of a chip 9, in this example using an aluminium alloy, it can be used to about 0.5 thru/or 0.6mm.

[0022] The scraps produced by cutting are smoothly discharged outside through a pocket 23 while they curl with a breaker 19 and are discharged.

[0023] This invention is variously deformable in the range which is not limited to the example mentioned above and does not deviate from the summary of this invention.

[0024] For example, as shown in drawing 5 , two insertion nuts 15 may be embedded on the body 3 of a cutter made from an aluminium alloy, and a cartridge 7 may be attached using two bolts 13. in this case, a cutting edge -- a chip 9 can still more certainly be fixed.

[0025]

[Effect of the Invention] the body of a cutter which consists of an aluminium alloy according to the face cutter of this invention -- an insertion nut -- embedding -- a cutting edge -- since it is the configuration which carries out bolt immobilization of the cartridge which fixed the chip, even if it is what constitutes the body of a cutter from an aluminium alloy -- a cutting edge -- a chip is certainly fixable.

[0026] Furthermore, since the body of a cutter is a product made from an aluminium alloy, and it can make weight light, it is easy handling and can also prevent vibration.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] Especially this invention relates to the face cutter whose body of a cutter is a product made from an aluminium alloy about a face cutter.

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PRIOR ART

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TECHNICAL PROBLEM

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EFFECT OF THE INVENTION

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[0026] Furthermore, since the body of a cutter is a product made from an aluminium alloy, and it can make weight light, it is easy handling and can also prevent vibration.

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MEANS

[Means for Solving the Problem] the body of a cutter with which the face cutter of this invention consists of an aluminium alloy in order to attain said purpose, and a cutting edge -- it has the cartridge to which the chip was fixed, and the insertion nut embedded on said body of a cutter, and said cartridge is characterized by carrying out bolt immobilization at the body of a cutter through said insertion nut.

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OPERATION

[Function] the face cutter of this invention -- a cutting edge -- in fixing a chip, a cartridge is fixed, next it carries out bolt immobilization of the cartridge at the body of a cutter made from an aluminium alloy. since it is not what a bolt is screwed in the insertion nut embedded on the body of a cutter, and is screwed in the body of a cutter made from a direct aluminium alloy -- a cutting edge -- saying [that a bolt shaves the body of a cutter and loosens at the time of anchoring of a chip and cutting] -- there is nothing -- a cutting edge -- a chip is certainly fixable.

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EXAMPLE

[Example] Below, with reference to an accompanying drawing, the example of this invention is explained at a detail.

[0009] As shown in drawing 1 and drawing 2, the face cutter 1 of this invention is the so-called thing which cuts a flat surface etc. and which carries out double-sided cutting. The body 3 of a cutter of this face cutter 1 is manufactured from the aluminium cast, and while lightweight-ization of the body of a cutter is attained, that manufacture can be performed easily. Through the installation hole 5, this body 3 of a cutter is attached in the driving shaft of a face cutter, and is driven.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view of the body of a cutter of the face cutter of this invention.

[Drawing 2] It is the top view of the body of a cutter shown in **drawing 1**.

[Drawing 3] a cutting edge -- it is the sectional view showing the breaker formed in the chip.

[Drawing 4] It is the sectional view showing an insertion nut and a bolt.

[Drawing 5] It is the sectional view of the body of a cutter in which other examples of this invention are shown.

[Description of Notations]

1 Face Cutter

3 Body of Cutter

9 Cutting Edge -- Chip

13 Bolt

15 Insertion Nut

[Translation done.]

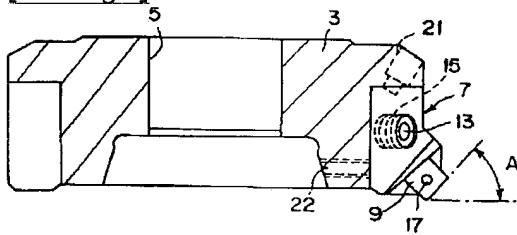
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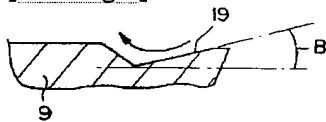
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DRAWINGS

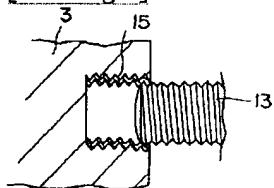
[Drawing 1]



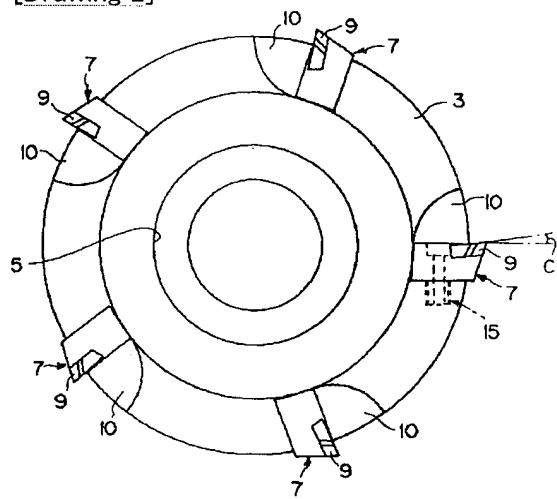
[Drawing 3]



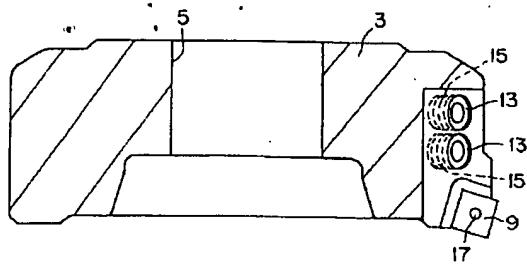
[Drawing 4]



[Drawing 2]



[Drawing 5]



[Translation done.]

JP7024619

**Title:
FACE MILLING CUTTER**

Abstract:

PURPOSE: To provide a face milling cutter by which a cutting edge chip can be fixed reliably to a cutter body formed of aluminium alloy. **CONSTITUTION:** In a face milling cutter, since constitution is set in such a way that an insert nut 15 is embedded in a cutter body 3 formed of aluminium alloy, and a cartridge 7 to which a cutting edge tip 9 is fixed is fixed by a bolt 13, even if the cutter body 3 is formed of aluminium alloy, the cutting edge tip 9 can be fixed reliably.

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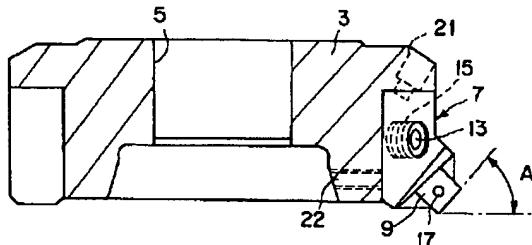
(74)代理人 弁理士 柳沢 昌之 (外1名)

(54)【発明の名称】 正面フライス

(57)【要約】

【目的】 アルミニウム合金製のカッター本体に切刃チップを確実に固定することができる正面フライスを提供する。

【構成】 本発明の正面フライス1によれば、アルミニウム合金からなるカッター本体3にインサートナット15を埋め込み、切刃チップ9を固定したカートリッジ7をボルト13にて固定する構成であるから、カッター本体3をアルミニウム合金で構成するものであっても切刃チップを確実に固定することができる。



1

2

【特許請求の範囲】

【請求項1】アルミニウム合金からなるカッタ一本体と、切刃チップが固定されたカートリッジと、前記カッタ一本体に埋め込まれたインサートナットとを備え、前記カートリッジは前記インサートナットを介してカッタ一本体にボルト固定されていることを特徴とする正面フライス。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、正面フライスに関し、特にカッタ一本体がアルミニウム合金製である正面フライスに関する。

【0002】

【従来の技術】従来の正面フライスは、切刃チップを取り付けるカッタ一本体は鋼から製造されているため、重量が重く、取扱いが不便になるという問題があった。特に、大型の正面フライスにあってはなおさらであった。

【0003】かかる問題点に対して、実公昭63-17606号公報には、カッタ一本体をアルミニウム合金製として重量の軽量化を図った構成が開示されている。更に、この公報に開示の技術では、カッタ一本体をアルミニウム合金製とすると、アルミニウム合金は比較的柔らかいため、ボルトに削られてしまいますので切刃チップの固定にボルトを用いずに、楔及び楔を用いて切刃チップを固定する構成が開示されている。

【0004】

【発明が解決しようとする課題】しかし、この公報に開示された正面フライスでは、楔により切刃チップを圧接固定しているが、焼入した楔とアルミ合金が直接こすられる為本体が摩耗、変形し切刃チップの確実な固定ができず、切刃チップに位置ずれや緩みが生じやすいという問題点がある。

【0005】そこで、本発明の目的は、アルミニウム合金製のカッタ一本体に切刃チップを確実に固定することができる正面フライスを提供することである。

【0006】

【課題を解決するための手段】前記目的を達成するため、本発明の正面フライスは、アルミニウム合金からなるカッタ一本体と、切刃チップが固定されたカートリッジと、前記カッタ一本体に埋め込まれたインサートナットとを備え、前記カートリッジは前記インサートナットを介してカッタ一本体にボルト固定されていることを特徴とする。

【0007】

【作用】本発明の正面フライスは、切刃チップを固定する場合には、カートリッジを固定し、次に、カートリッジをアルミニウム合金製のカッタ一本体にボルト固定する。ボルトは、カッタ一本体に埋め込まれたインサートナットに螺合され、直接アルミニウム合金製のカッタ一本体に螺合するものでないから、切刃チップの取付け時

や切削作業時に、ボルトがカッタ一本体を削って緩むということなく、切刃チップを確実に固定することができる。

【0008】

【実施例】以下に、添付図面を参照して本発明の実施例を詳細に説明する。

【0009】図1及び図2に示すように、本発明の正面フライス1は、平面等を切削するいわゆる両面切削するものである。この正面フライス1のカッタ一本体3は、アルミニウム錫物から製造されており、カッタ一本体の軽量化が図られているとともにその製造が容易にできる。このカッタ一本体3は、取り付け穴5を介して正面フライスの駆動軸に取り付けられて駆動される。

【0010】カッタ一本体3には、その正面に複数のカートリッジ7、本実施例では5個の切刃カートリッジ7が等間隔に配置されている。尚、図2において、各カートリッジ7の手前に形成されているのは、切り屑を排出するためのポケット10である。

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【0011】この切刃カートリッジ7はボルト13によりインサートナット15を介してカッタ一本体3に固定されている。

【0012】切刃チップ9は、いわゆる超硬製であり、ビス17によりカートリッジ7に固定されている。この切刃チップ9は、切削時に切刃部分が所定のコーナー角Aを形成するように取り付けられている。このような切刃チップ9のコーナー角Aは、予め種々のコーナー角Aを形成した切刃チップ9をカートリッジ7に固定したものを一体としておくことによって、これらの切刃カートリッジ7を交換することにより、容易に変更できるようになっている。

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【0013】また、カッタ一本体3の半径の延長線に対しても所定角度Cの傾きを持っており、この所定角度Cは本実施例では約3度に設定されている。

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【0014】切刃チップ9には、更に、図3に示すように、ブレーカ19が形成されており、切り出した切り屑をカールさせて、カッタ一本体3に接触させることなく排出するようになっている。このブレーカ19は、角度付きの全周ブレーカーであり、カッタ一本体3の径方向のすくい角Bを約10乃至20度に形成しているが、ブレーカは角度付きでなく円弧状であってもよい。このような範囲にすくい角を形成することにより、切削時における負荷を軽減することができる。

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【0015】カートリッジ7は鋼製であり、ボルト13によりカッタ一本体3に固定されている。ボルト13は、図4に示すように、カッタ一本体3に予め埋め込まれたインサートナット15に螺合されるので、アルミニウム合金製であるため比較的柔らかいカッタ一本体3であっても確実に固定することができる。インサートナット15としては、例えば、ケルブコナス(Kerb Konus)社製のエンザート(商標)が用いられる。

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【0016】尚、図1中において、カートリッジ7の上に設けられているねじ21は、切刃チップの切削位置の調節用のねじであり、カートリッジ7をカッターボディ3に取り付け後、切刃チップ9の位置を微調整できるようになっている。

【0017】次に、本実施例の作用について説明する。

【0018】本実施例による正面フライス1において、カッターボディ3に切刃チップ9を取り付けるときには、予め本体に固定されたカートリッジ7にボルト17で固定する。これにより、切刃チップ9の取り付けを容易に行うことができる。尚、カートリッジ7は破損時は使い捨てとなっている。このような切刃チップ9の取り付け時や切削時において、カッターボディ3はアルミニウム合金から作られているから、極めて軽量であり、切刃チップ9の取付けや切削作業が容易にできる。

【0019】ボルト13によりカートリッジ7を固定した後、微量調節ねじ21、22により切刃チップ9の径方向、軸方向位置を調節する。このように、本実施例では、切刃チップ9の取付け後においてもその微量調節ができるようになっている。

【0020】また、カートリッジ7の固定には、カッターボディ3にインサートナット15を用いているから、アルミニウム合金製のカッターボディ3であっても鋼製のボルト13によりカートリッジ7を確実に固定することができる。

【0021】切削作業時には、カッターボディ3がアルミニウム合金から構成されており軽量であることから、取扱い安く作業性がよい。更に、アルミニウム合金は、鋼等に比較して減衰率が大きいことから、切削時における振動を防止でき、これにより騒音の防止とツールライフの向上を図ることができる。例えば、切刃チップ9のツールライフにあっては、従来の鋼の場合には、約0.2mm程度で使用できなくなっていたが、アルミニウム合金を用いた本実施例では約0.5乃至0.6mmまで使用することができる。

【0022】切削により生じた切り屑は、ブレーカー1

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9によりカールされて排出されるとともに、ポケット23を介してスムーズに外に排出される。

【0023】本発明は、上述した実施例に限定されず、本発明の要旨を逸脱しない範囲で種々変形可能である。

【0024】例えば、図5に示すように、アルミニウム合金製のカッターボディ3には2個のインサートナット15を埋め込み、ボルト13を2本用いてカートリッジ7を取り付けるものであってもよい。この場合には、切刃チップ9を更に確実に固定することができる。

【0025】

【発明の効果】本発明の正面フライスによれば、アルミニウム合金からなるカッターボディにインサートナットを埋め込み、切刃チップを固定したカートリッジをボルト固定する構成であるから、カッターボディをアルミニウム合金で構成するものであっても切刃チップを確実に固定することができる。

【0026】更に、カッターボディはアルミニウム合金製であるから、重量を軽くすることができる所以取扱いが容易であり、且つ振動も防止できる。

【図面の簡単な説明】

【図1】本発明の正面フライスのカッターボディの断面図である。

【図2】図1に示すカッターボディの平面図である。

【図3】切刃チップに形成されたブレーカーを示す断面図である。

【図4】インサートナットとボルトとを示す断面図である。

【図5】本発明の他の実施例を示すカッターボディの断面図である。

【符号の説明】

1 正面フライス

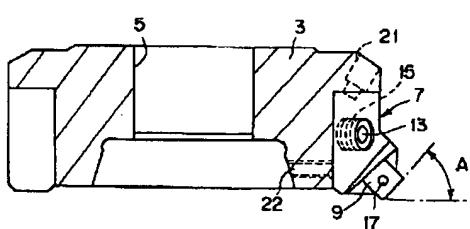
3 カッターボディ

9 切刃チップ

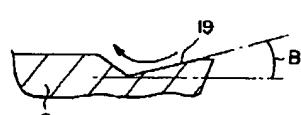
13 ボルト

15 インサートナット

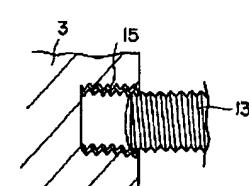
【図1】



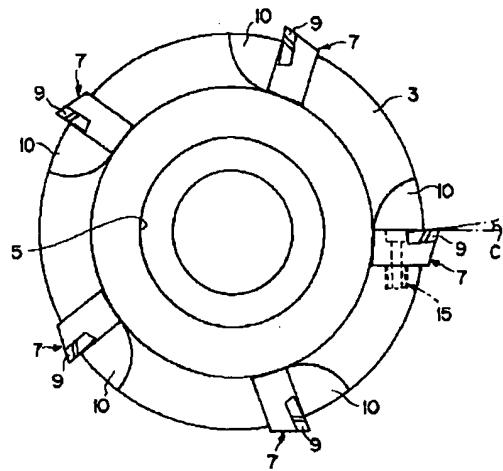
【図3】



【図4】



【図2】



【図5】

